

## CLAIMS

1. Electronic timepiece allowing the display of at least a first ( $H_1$ ) and a second ( $H_2$ ) time related data item, said first time related data item ( $H_1$ ) being based on the Hour-Minute-Second system (H-M-S), this timepiece including a time base (2) supplying pulses to a frequency divider circuit (4) including N binary division stages (4.1 to 4.N) and supplying first control pulses ( $I_1$ ) allowing said first time related data item ( $H_1$ ) to be formed and displayed, this timepiece further including generating means (14) arranged to supply, from auxiliary control pulses ( $I_L$ ) originating from said time base (2), second control pulses ( $I_2$ ) allowing said second time related data item ( $H_2$ ) to be formed and displayed,

10 this timepiece being characterised in that said second time related data item ( $H_2$ ) is based on a decimal system in which the time is divided at least into thousandths of a day and in that said second time related data item ( $H_2$ ) is displayed with three digits so that it cannot be confused with said first time related data item ( $H_1$ ),

15 said generating means (14) being arranged to count successively the auxiliary control pulses ( $I_L$ ) in accordance with a counting sequence formed of counting operations of n and n+1 auxiliary control pulses ( $I_L$ ) succeeding each other in accordance with a determined order so that said generating means (14) supply the second control pulses ( $I_2$ ) at a mean frequency allowing said second time related data item ( $H_2$ ) based on the decimal system to be formed, n being an integer number directly less than the division ratio of the frequency of said auxiliary control pulses ( $I_L$ ) by the frequency of said second control pulses ( $I_2$ ).

2. Electronic timepiece according to claim 1, characterised in that said counting operations of n and n+1 auxiliary control pulses ( $I_L$ ) follow each other in accordance with an order determined so that the second control pulses ( $I_2$ ) are supplied with minimum time error.

3. Electronic timepiece according to claim 1 or 2, characterised in that said counting sequence is comprised in a table including as many entries as there are counting operations.

30 4. Electronic timepiece according to claim 3, characterised in that said table is formed of a binary word in which the binary value « 0 » indicates that n auxiliary

control pulses ( $I_L$ ) must be counted and the binary value « 1 » indicates that  $n+1$  auxiliary control pulses ( $I_L$ ) must be counted.

5      5. Electronic timepiece according to claim 3 or 4, characterised in that the entries of said table are indexed by means of a register containing a value of said second time related data item ( $H_2$ ).

6. Electronic timepiece according to claim 1 or 2, characterised in that said counting operations of  $n$  or  $n+1$  auxiliary control pulses ( $I_L$ ) are determined by means of a register containing a value of said second time related data item ( $H_2$ ).

10      7. Electronic timepiece allowing the display of at least a first ( $H_1$ ) and a second ( $H_2$ ) time related data item, said first time related data item ( $H_1$ ) being based on the Hour-Minute-Second system (H-M-S), this timepiece including a time base (2) supplying pulses to a frequency divider circuit (4) including  $N$  binary division stages (4.1 to 4.N) and supplying first control pulses ( $I_1$ ) allowing said first time related data item ( $H_1$ ) to be formed and displayed, this timepiece further including generating  
15      means (14) arranged to supply, from auxiliary control pulses ( $I_L$ ) originating from said time base (2), second control pulses ( $I_2$ ) allowing said second time related data item ( $H_2$ ) to be formed and displayed,

20      this timepiece being characterised in that said second time related data item ( $H_2$ ) is based on a decimal system in which the time is divided at least into thousandths of a day and in that said second time related data item ( $H_2$ ) is displayed with three digits so that it cannot be confused with said first time related data item ( $H_1$ ),

25      said generating means (14) including a primary counter (141) arranged for counting  $n$  auxiliary control pulses ( $I_L$ ), and inhibition means (142) for said primary counter (141) arranged for periodically inhibiting  $K$  auxiliary control pulses ( $I_L$ ) upstream of said primary counter (141), so that the latter supplies the second control pulses ( $I_2$ ) at a mean frequency allowing said second time related data item ( $H_2$ ) based on the decimal system to be formed,  $n$  being an integer number directly less than the division ratio of the frequency of said auxiliary control pulses ( $I_L$ ) by the  
30      frequency of said second control pulses ( $I_2$ ).

8. Electronic timepiece according to claim 7, characterised in that said inhibition means (142) include a secondary counter (144) arranged for counting  $m$  auxiliary control pulses ( $I_L$ ), a logic detection circuit (146) coupled to said secondary

counter (144) so as to detect k intermediate states thereof, and an AND logic gate (148) including two inputs, one being inverted and connected to an output of said logic detection circuit (146) and the other receiving said auxiliary control pulses ( $I_L$ ), said logic detection circuit (146) sending an inhibition signal blocking the AND logic gate (148) when one of the k intermediate states is detected, so that one auxiliary control pulse ( $I_L$ ) is inhibited upstream of said primary counter (141).

9. Electronic timepiece according to claim 8, characterised in that said k intermediate states are selected so as to be equidistant from each other.

10. Electronic timepiece allowing the display of at least a first ( $H_1$ ) and a second ( $H_2$ ) time related data item, said first time related data item ( $H_1$ ) being based on the Hour-Minute-Second system (H-M-S), this timepiece including a time base (2) supplying pulses to a frequency divider circuit (4) including N binary division stages (4.1 to 4.N) and supplying first control pulses ( $I_1$ ) allowing said first time related data item ( $H_1$ ) to be formed and displayed, this timepiece further including generating means (14) arranged to supply, from auxiliary control pulses ( $I_L$ ) originating from said time base (2), second control pulses ( $I_2$ ) allowing said second time related data item ( $H_2$ ) to be formed and displayed,

this timepiece being characterised in that said second time related data item ( $H_2$ ) is based on a decimal system in which the time is divided at least into thousandths of a day and in that said second time related data item ( $H_2$ ) is displayed with three digits so that it cannot be confused with said first time related data item ( $H_1$ ),

said generating means (14) including a primary counter (241) arranged for counting  $n+1$  auxiliary control pulses ( $I_L$ ), and initialisation means (242) coupled to said primary counter (241) and arranged for periodically initialising said primary counter (241) with a value k corresponding to a complementary number of auxiliary control pulses ( $I_L$ ) so that said primary counter (241) supplies the second control pulses ( $I_2$ ) at a mean frequency allowing said second time related data item ( $H_2$ ) based on the decimal system to be formed,  $n+1$  being an integer number directly greater than the division ratio of the frequency of said auxiliary control pulses ( $I_L$ ) by the frequency of said second control pulses ( $I_2$ ).

11. Electronic timepiece according to claim 10, characterised in that said initialisation means (242) include a secondary counter (244) arranged for counting m

second control pulses ( $I_2$ ) and an initialisation circuit (246) coupled to said primary counter (241), said secondary counter (244) providing a signal to said initialisation circuit (244) every  $m$  second control pulses ( $I_2$ ) so that said primary counter (241) is initialised with a value  $k$ .

5           12. Electronic timepiece according to any of claims 1 to 11, characterised in that said auxiliary control pulses ( $I_L$ ) are supplied at an output of one (4.L) of the binary division stages (4.1 to 4.N) of said frequency divider circuit (4).

10           13. Electronic timepiece according to any of claims 1 to 11, characterised in that said auxiliary control pulses ( $I_L$ ) are supplied at an output of  $N^*$  additional binary division stages (4.N+1 to 4.N+N\*) connected after said frequency divider circuit (4) upstream of said generating means (14).

14. Electronic timepiece according to any of claims 1 to 11, characterised in that said generating means (14) supply said second control pulses ( $I_2$ ) at a mean frequency of 1/8.64 Hz.

15           15. Electronic timepiece according to any of claims 1 to 11, characterised in that said generating means (14) supply said second control pulses ( $I_2$ ) at a mean frequency of 1/86.4 Hz.